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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/891,700	06/26/2001	Vijayakumar R. Dhuler	9134-32CT	2751

20792 7590 08/05/2002

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EXAMINER

LE, DANG D

ART UNIT	PAPER NUMBER
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2834

DATE MAILED: 08/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/891,700

Applicant(s)

DHULER

Examiner

Dang D Le

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,6-11,35,36,40 and 42-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,6-11,35,36,40 and 42-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☒ Interview Summary (PTO-413) Paper No(s). 13.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1, 2, 6-11, 35, 36, 40, 42-44 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 6-10, 35, 36, 40, 42 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carr et al. (5,796,152) in view of Petersen et al. (5,355,712).

Regarding claim 1, Carr et al. show a microelectromechanical device (Figures 4-6) comprising:

- A microelectronic substrate (50);
- A thermally actuated micro actuator (52) disposed on said substrate; and
- At least one metallic structure (71, 72) disposed on said substrate and spaced from said micro actuator, wherein said micro actuator is adapted to operably contact (with 76) said at least one metallic structure in response to thermal actuation thereof.

Carr et al. do not show the thermally actuated micro actuator being comprised of a single crystalline material.

Petersen et al. show the actuating beams (38) being comprised of single crystalline material (column 5, lines 40-55) for the purpose of maintaining the same coefficient of expansion.

Since Carr et al. and Petersen et al. are all from the same field of endeavor, the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to make the micro actuator with only single crystalline material as taught by Petersen et al. for the purpose discussed above.

Regarding claim 2, it is noted that Carr et al. also show said at least one metallic structure comprising two metallic structures (71, 72).

Regarding claim 6, it is noted that Carr et al. also show the micro actuator further comprising:

- Spaced apart supports (Figure 6) disposed on said substrate;
- At least one arched beam (54) extending between said spaced apart supports;
- An actuator member (76) operably coupled to said at least one arched beam and extending outwardly therefrom; and
- Means for heating (78) said at least one arched beam to cause further arching thereof such that said actuator member (76) moves between a first position in which said actuator member is spaced apart from said at least one

metallic structure and a second position in which said actuator member operably engages said at least one metallic structure.

Regarding claim 7, it is noted that Carr et al. also show said micro actuator being thermally activated by internal heating thereof (Figure 10).

Regarding claim 8, it is noted that Carr et al. also show said micro actuator being thermally activated by external heating thereof (Figure 5).

Regarding claim 9, it is noted that Carr et al. also show said micro actuator comprising a plurality of arched beams coupled together (Figure 5).

Regarding claim 10, it is noted that Petersen et al. also show said micro actuator being comprised of single crystal silicon.

Regarding claim 35, Carr et al. show a microelectromechanical device (Figures 4-6) comprising:

- A microelectronic substrate (50);
- A micro actuator (52) disposed on said substrate; and
- At least one metallic structure (71, 72) disposed on said substrate adjacent said micro actuator and on substantially the same plane (on the same surface of 50), wherein said micro actuator is adapted to operably contact said at least one metallic structure in response to actuation thereof.

Carr et al. do not show the micro actuator being comprised of a single crystalline material.

For the purpose of maintaining the same coefficient of expansion, Petersen et al. show the actuating beams (38) being comprised of single crystalline material (column 5, lines 40-55).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to make the micro actuator with only single crystalline material as taught by Petersen et al. for the purpose discussed above.

Regarding claim 36, it is noted that Carr et al. also show the micro actuator being at least one of a thermally actuated micro actuator and an electrostatic micro actuator.

Regarding claim 40, it is noted that Carr et al. also show the micro actuator further comprising:

- Spaced apart supports (Figure 6) disposed on said substrate;
- At least one arched beam (54) extending between said spaced apart supports;
- An actuator member (76) operably coupled to said at least one arched beam and extending outwardly therefrom; and
- Means for heating (78) said at least one arched beam to cause further arching thereof such that said actuator member moves between a first position in which said actuator member is spaced apart from said at least one metallic structure and a second position in which said actuator member operably engages said at least one metallic structure.

Regarding claim 42, it is noted that Petersen et al. also show said micro actuator being comprised of single crystalline silicon.

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Regarding claim 44, it is noted that Carr et al. also shows the micro actuator being configured to move between an actuated and unactuated position substantially within the plane (surface of substrate 50) of the micro actuator and the at least one metallic structure.

4. Claims 11 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carr et al. (5,796,152) in view of Petersen et al. (5,355,712) as respectively applied to claims 1 and 35 above, and further in view of Haake (5,881,198).

Regarding claims 11 and 43, the device of Carr et al. modified by Petersen et al. includes all of the limitations of the claimed invention except for the at least one metallic structure being comprised at least one of nickel and gold.

Haake uses gold in the metallic structure for the purpose of reducing resistivity.

Since Carr et al., Petersen et al. and Haake are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to make the at least one metallic structure with at least one of nickel and gold as taught by Haake for the purpose discussed above.

Information on How to Contact USPTO

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dang D Le whose telephone number is (703) 305-0156. The examiner can normally be reached on Monday through Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

DDL
August 1, 2002

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